

RESEARCH ARTICLE

Factors associated with accurate reporting of public and private health insurance type

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Abstract

Objective: To examine factors associated with accurate reporting of private and public health insurance coverage.

Data sources: Minnesota health plan enrollment records provided the sample for the Comparing Health Insurance Measurement Error (CHIME) study, a survey conducted in 2015 that randomly assigned enrollees to treatments that included health insurance questions from the American Community Survey (ACS) or the redesigned Current Population Survey Annual Social and Economic Supplement (CPS).

Study design: Reverse record check study that compared CHIME study survey responses to enrollment records of coverage type (direct purchase on and off the Marketplace, Medicaid, or MinnesotaCare), service use, subsidy receipt, and duration of coverage from a major insurer.

Data collection methods: Using matched enrollment and CHIME survey data and logistic regression, we examined correlates of accurate insurance type reporting, including characteristics of the insurance coverage, the covered individual, respondent, and family.

Principal findings: Reporting accuracy across treatment and coverage type is high (77%–84%). As with past research, accurate reporting of public insurance is higher for people with characteristics consistent with eligibility for public insurance for both survey treatments. For the ACS treatment, reports of direct purchase insurance are more accurate for enrollees who receive a premium subsidy.

Conclusions: Given the complexity of health insurance measurement and frequently changing policy environment, differences in reporting accuracy across treatments or coverage types are not surprising. Several results have important implications for data editing and modeling routines. First, adding premium and subsidy questions in federal surveys should prove useful given the finding that subsidy receipt is associated with reporting accuracy. Second, across both survey treatments, people whose opportunity structures (race, ethnicity, and income) match public program eligibility are accurate reporters of this coverage. This evidence supports using these commonly collected demographic variables in simulation, imputation, and editing routines.

KEYWORDS

American Community Survey, Current Population Survey, health insurance, Marketplace, Medicaid, reporting accuracy

What is known on this topic

- Identifying factors associated with accurate health insurance reporting may help refine models that account for measurement error and boost confidence in insurance coverage estimates.
- Past research on correlates of reporting accuracy is limited to Medicaid, precedes the Affordable Care Act (ACA), and precedes the redesign of the Current Population Survey Annual Social and Economic Supplement (CPS).
- Medicaid reporting accuracy varies by survey, characteristics of enrollees (e.g., age, administrative record reports of health care use, and duration of coverage), and respondent characteristics (e.g., income, education, and employment).

What this study adds

- Explores correlates of reporting accuracy among people with public and private coverage (including Marketplace coverage) after full implementation of the ACA.
- Contrasts accuracy of reporting for the Comparing Health Insurance Measurement Error (CHIME) survey respondents receiving the health insurance questions series adapted from the American Community Survey (ACS) and the redesigned CPS.
- We find that correlates of accurate reporting of public and subsidized Marketplace insurance are associated with program eligibility, which provides credibility to commonly applied data editing routines and simulation models.

1 | INTRODUCTION

Errors in reporting health insurance coverage are well documented in validation studies,^{1–4} as is variation in the magnitude of measurement error by coverage type^{5–7} and survey design.^{1,7,8} For example, over 89% of people known to have employer-sponsored insurance (ESI) based on enrollment records are reported as having ESI in surveys.^{5–7} By contrast, 57%–89% of people known to have Medicaid coverage are accurately reported as having public insurance.^{1,7} Persistent survey underreporting of Medicaid led to concerns of bias in estimates of the uninsured used in funding formulas. Fortunately, validation studies reveal that when Medicaid is not reported a different coverage type is usually reported in its place, resulting in relatively little bias in the measure of the uninsured and providing confidence in estimates used to guide policy and budget allocations at the federal and state levels.^{1,7}

Yet substantial error in reporting specific types of insurance coverage remains, and error rates vary across survey instruments and survey participants.^{1,7} Simulation models and other error-accounting methods are informed by what is known from studies about correlates of measurement error. Generally speaking, designers of surveys do not want classification errors to be dependent on person or plan-level characteristics, yet understanding factors associated with accurate health insurance reporting provides information needed to refine data processing routines and models that account for measurement error (e.g., the Urban Institute's Transfer Income Model [TRIM] and policy

analysis conducted by the Congressional Budget Office).^{2,8} For example, the TRIM3 microsimulation model estimates the number of families, households, or people eligible for a range of government programs. To estimate program participation rates, it “corrects for underreporting of benefits in survey data in order to provide a more complete picture” of program participation.⁹

In light of this contradiction in the precision of reporting between the uninsured and specific forms of coverage, this study explores factors associated with accurate reporting of insurance type. It moves beyond the usual focus on Medicaid reporting accuracy to examine reporting accuracy for private insurance; because the study occurred after the implementation of the Affordable Care Act (ACA) Marketplace enrollees are included. Additionally, we contrast factors associated with reporting accuracy for two federal surveys commonly used to measure health insurance coverage: the American Community Survey (ACS) and the redesigned Current Population Survey's Annual Social and Economic Supplement (CPS).¹⁰ Results from this study can inform data editing and modeling routines that account for measurement error.

Past research demonstrates that Medicaid reporting accuracy varies by a range of factors. For example, the Medicaid undercount was higher in the CPS compared with other federal surveys before the 2014 redesign.¹ Medicaid coverage is more accurately reported for an enrolled child versus an enrolled adult in the household.^{4,8,11,12} People who identify as White non-Hispanic^{3,4,8,11,12} and U.S. born³ are more accurate reporters of their own or a family members' coverage.

Medicaid reporting is generally more accurate among the socioeconomically disadvantaged; specifically, people in low-income households,^{8,11,12} who are unemployed,¹¹ and have a high school degree or less.^{3,8,11} The relationship between gender and reporting accuracy is inconsistent, with some research indicating women are more accurate reporters of Medicaid than men,^{3,4} vice versa,⁸ or no relationship.¹¹ Reporting is also more accurate among people reporting fair and poor health.¹¹

Links between surveys and administrative records reveal Medicaid reporting accuracy is correlated with receipt of medical care in the past year^{4,12} and participation in other government programs, such as Social Security Income or Temporary Assistance to Needy Families.^{11,12} In addition, Medicaid reporting prior to the CPS redesign was more accurate when administrative records indicated Medicaid enrollment close to the time of the survey and for longer periods of time.^{3,4} Finally, Medicaid reporting was more accurate among people reporting for themselves or for others in the household who share the same coverage.⁴

The ACA introduced new possibilities for measurement error and the potential for shifts in correlates of accurate reporting. First, the ACA provided states the opportunity to expand Medicaid to childless adults and people with modestly higher incomes, which are characteristics tied to less accurate Medicaid reporting.^{8,11,12} Second, the ACA introduced new subsidized Marketplace coverage and a new federal or state-based exchange (i.e., Marketplace) where applicants may qualify for public health insurance or the new private Marketplace coverage. As such, the term “Marketplace” represents both a form of direct purchase coverage and a “no wrong door” venue for establishing eligibility for, and enrolling in, a range of health insurance types. Insurance available on the Marketplace range from fully subsidized Medicaid insurance to partially subsidized private insurance to unsubsidized private insurance, depending on eligibility. Recent research demonstrates that the Medicaid/Children’s Health Insurance Program (CHIP) overcount in the ACS prior to passage of the ACA shifted to an undercount, but only in Medicaid expansion states.¹³ In addition, research post-ACA and post-CPS redesign indicates reporting accuracy in the redesigned CPS among Marketplace enrollees is lower (70.6%) than for Medicaid enrollees (77.6%), and people who purchased non-group insurance outside the Marketplace (72.6%). However, Marketplace enrollees currently represent a small segment of the overall population, which tempers the impact of this bias on the overall distribution of insurance coverage.¹⁴

This study addresses several gaps in knowledge about correlates of health insurance reporting error. Using linked survey and administrative data, we examine a variety of person, family, and coverage level characteristics associated with accurate reporting of insurance type. First, we use data collected after full implementation of the ACA. Second, we explore correlates of reporting accuracy among people with public and private insurance, including those with direct purchase plans both off and on the Marketplace. Finally, we contrast correlates of accurate reporting for those responding to health insurance question from the ACS and the redesigned CPS—two U.S. Census Bureau surveys that are widely used to monitor coverage and reform efforts at the state and federal levels.

2 | METHODS

2.1 | Data

The Comparing Health Insurance Measurement Error (CHIME) study is an experimental reverse record check study that compared respondents’ reports of coverage to administrative records to understand the magnitude, direction, and pattern of misreporting. Consistent with past covariate analyses,^{3,4,8,11,12} this analysis focuses on sensitivity (the percentage of individuals who are known to have coverage type “X” for whom coverage type “X” is reported in the CHIME survey). Administrative records confirmed enrollment at the time of the CHIME study.

The CHIME telephone survey was completed in the spring of 2015 (English language only) by a stratified random sample of households with Minnesota addresses, telephone numbers for a policyholder under the age of 65 provided through a large Midwest insurer. The sample represents a broad array of insurance types: ESI, non-group, Marketplace, Medicaid (comprehensive, not partial benefit programs), and MinnesotaCare. MinnesotaCare is a public program for adults with incomes above Medicaid and below Marketplace eligibility who do not have an affordable offer (using ACA thresholds) of insurance through their employer. Enrollees pay a monthly sliding fee premium based on income, making this program similar to programs that require a premium in other states (e.g., CHIP, some Medicaid expansion plans, and other small state-financed programs—see Appendix C).¹⁵

Consistent with ACS and CPS, an adult respondent completes the CHIME survey for all members of the household. The CHIME survey begins with a series of demographic (e.g., age, gender, race, ethnicity, nativity, etc.) and socioeconomic questions (e.g., marital and employment status, income, etc.) modeled after the ACS, followed by health insurance questions. Half of the respondents were randomly assigned the health insurance questions from the redesigned CPS (CPS treatment), and half received the health insurance question series from the ACS (ACS treatment).

CHIME interviews were completed by Census Bureau interviewers. The response rate was 22.0%.¹⁶ After interviewing was completed, we used a computer algorithm to match the CHIME study person-record to the enrollment person-record using variables on both datasets: phone number, name, sex, date of birth, and address. During the lag between the sample draw and the interview, phone numbers can change, household members can move, and/or not all household members have insurance through this plan. Overall, at least one person was matched to enrollment records for 87.0% of CHIME households.¹⁵ The final analysis file included 1528 and 1619 people, respectively, assigned to the ACS and CPS treatments. The study received IRB approval.

2.2 | Health insurance series

The ACS and CPS differ in their approach to measuring health insurance. Figure 1 provides an abbreviated version of both modules

(for the complete modules, see Appendix B¹⁵). The ACS treatment asks a series of “yes/no” questions about current coverage of specific types: a current or former employer, insurance purchased directly from an insurance company, Medicare, Medicaid, or government assistance plans, etc. The ACS treatment asks a single question about any type of public coverage and does not distinguish between Medicaid and MinnesotaCare coverage. At the time CHIME was fielded, the ACS had not yet been adapted for Marketplace coverage: it was expected that Marketplace enrollees would report their coverage as purchased directly from an insurance company. This meant Marketplace coverage cannot be separated from other non-group coverage.

In contrast, the CPS treatment uses the approach adopted in the redesign, asking a broad question about the source of coverage first

(government or job) followed by questions to enable more specific coverage type categorization. The CPS asks questions that allow categorization of non-group and Marketplace coverage (items 11–13) as well as Medicaid versus other public coverage (items 9–13). For this analysis, CPS coverage types are aggregated to match the ACS categories.

2.3 | Covered individual and respondent characteristics

Most correlates of accuracy come from the CHIME survey, although some are drawn from administrative records or both (noted in tables).

CPS	ACS
<p><i>Logic Check 1: If disabled or age=65+ →1; else →2</i></p> <ol style="list-style-type: none"> 1. Are you covered by Medicare? <ul style="list-style-type: none"> • Yes →14 • No →2 2. Are you NOW covered by any type of health plan? <ul style="list-style-type: none"> • Yes →3 • No →Qs on Medicaid and other public plans; verify currently uninsured →18 3. Is it provided thru a job, govt, or other way? <ul style="list-style-type: none"> • Job →6 • Government →4 • Other way →7 4. Is that plan related to a JOB with the government? <ul style="list-style-type: none"> • Yes →6 • No →5 5. Is that Medicaid/CHIP, Medicare, military, other? <ul style="list-style-type: none"> • Medicaid/CHIP/other/DK →9 • Military →[type of military plan] →10 • Medicare →14 6. Is the plan related to military service in any way? [if yes, type of military plan] →10 7. How is it provided – parent/spouse, direct, other? <ul style="list-style-type: none"> • Parent/spouse/direct →10 • Other →8 8. Is it thru former emp, union, group, assn, school? <ul style="list-style-type: none"> • Former emp/union/group/assn/school →10 • Other →9 9. What do you call the program? <ul style="list-style-type: none"> • Medicaid • Medical Assistance • Indian Health Service • MinnesotaCare • Minnesota Comprehensive Health Association • PMAP • Healthcare.gov • Plan through MNsure • Other government plan • Other (please specify) →11 10. Who is the policyholder? [If direct in Q7 → 11; else → 14] 11. Is that coverage thru the marketplace? 12. Is there a monthly premium? [if yes → 13; else →14] 13. Is the premium subsidized based on family income? 14. [Questions on past months of coverage] 15. Any [other] coverage Jan 2014 till now? <ul style="list-style-type: none"> • Yes →loop thru series again, starting with 3 • No →Logic Check 2 for next person on roster <p><i>Logic Check 2: For this next person, if any coverage was already reported, start with Q15; else start with Logic Check 1; If no more people on roster →END</i></p>	<ol style="list-style-type: none"> 1. Are you currently covered by health insurance through a current or former employer or union? <ul style="list-style-type: none"> • Yes • No 2. Are you currently covered by health insurance purchased directly from an insurance company? <ul style="list-style-type: none"> • Yes • No 3. Are you currently covered by Medicare, for people age 65 or older or people with certain disabilities? <ul style="list-style-type: none"> • Yes • No 4. Are you currently covered by Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability? <ul style="list-style-type: none"> • Yes • No 5. Are you currently covered by TRICARE or other military health care? <ul style="list-style-type: none"> • Yes • No 6. Are you currently covered through the Veteran’s Administration or have you ever used or enrolled for VA health care)? <ul style="list-style-type: none"> • Yes • No 7. Are you currently covered through the Indian Health Service? <ul style="list-style-type: none"> • Yes • No 8. Are you currently covered by any other type of health insurance or health coverage plan? <ul style="list-style-type: none"> • Yes → (Specify) • No

FIGURE 1 Abbreviated CPS and ACS 2014 health insurance modules

We include the general health status of the covered individual reported in the CHIME survey and a claims-based measure of prior-year health care use ending at the close of the survey in May and June 2015. Age was calculated using the date of birth from the administrative data. We include self-reported characteristics of CHIME respondents: race/ethnicity (dichotomized due to small sample sizes); U.S. or foreign-born status; gender; education and employment status; and employer size (associated with having an offer of ESI).

2.4 | Family characteristics

The CHIME survey includes measures of family size and a categorical measure of prior-year family income as a percent of federal poverty guidelines (FPG), with resultant poverty ratios that approximate program eligibility thresholds: Less than 139% FPG for Medicaid; 139%–199% FPG for MinnesotaCare; 200%–400% FPG for subsidized Marketplace coverage; above 400% FPG for Marketplace coverage without a subsidy.

2.5 | Insurance coverage characteristics

We created several measures that capture the complexity of the survey-reporting task for respondents. The measure of shared coverage was modeled after previous work.⁴ Specifically, CHIME survey data indicating proxy versus respondent status and household size were combined with enrollment data to establish whether the respondent is reporting coverage for themselves in a single or multi-person household, and whether they are reporting for other household members with whom they do or do not share the same coverage. Second, using administrative records, we include an indicator of the number of consecutive months covered by the same insurance type over the 17-month period beginning with January 2014, ending the month of the interview in 2015. Finally, we include an administrative records indicator of whether the respondent is the policyholder and an indicator of whether those enrolled in Marketplace coverage received a subsidy.

2.6 | Analysis samples

Given high rates of reporting accuracy of ESI coverage (98.1% for the CPS; 95.6% for the ACS),⁷ we restrict our analysis to three coverage types: (1) non-group (which includes Marketplace plans), (2) Medicaid alone, and (3) Medicaid in combination with MinnesotaCare (labeled “augmented” sample). As described above, Medicaid and MinnesotaCare are combined because the latter cannot be distinguished in the ACS treatment. We present the augmented sample because many states have public programs that charge a premium, akin to MinnesotaCare. Non-group plans are combined with Marketplace because the latter cannot be distinguished in the ACS treatment. In addition, the small sample with Marketplace coverage (fewer than

200 unweighted cases in each treatment) raised concerns about power in the regression analysis.

2.7 | Analysis plan

We provide descriptive statistics combined for each insurance type separately: non-group and Marketplace; Medicaid; and augmented public coverage (i.e. Medicaid and MinnesotaCare). The ACS and CPS treatments in the CHIME study were combined for the descriptive analysis because there were few important differences in means, given the study design randomized participants to survey treatment.

We estimate logistic regression models to examine correlates of accurate insurance type reporting for participants by coverage type and survey treatments. The dependent variable is equal to “one” if enrollment records indicate coverage type X and the CHIME respondent reports insurance X and “zero” if enrollment records indicate coverage type X and the respondent does not report X. While not described here, among those misreporting, most study respondents report a different source of coverage with only a small percent falsely reporting no coverage.^{7,14} Chow tests indicated that the coefficients were jointly significantly different across survey treatments, and thus should not be pooled in regression analysis. (The logistic regressions include an insurance type indicator based on enrollment records [e.g., non-group = 0; Marketplace = 1]; significance suggests the two insurance types should not be combined.)

Data are weighted to represent the universe of enrollees from the health plan using data available in enrollment records. Weights account for differential response rates by age across insurance type, and we correct for clustering within households.¹⁵

3 | RESULTS

Sample characteristics for each insurance type vary, given differences in plan structure and eligibility criteria (Table 1). For example, private insurance includes a smaller proportion of children and a higher proportion aged 45 and older compared with public insurance. This makes sense, as Medicaid primarily serves children and mothers, as shown in the age and gender distribution. Because MinnesotaCare serves an adult population by design, the age distribution for this type of coverage shifts toward older age groups and includes more males in the augmented sample. Consistent with historical and current-day systems of racism that constrain economic opportunities,^{17,18} people covered by private insurance have higher educational attainment, higher income, and are more likely to be White, compared with people covered by public insurance. The family income distributions (as a percent of FPG) are consistent with eligibility thresholds for these insurance types. Specifically, the modal family income category for private insurance is 400% FPG and above, followed by 200%–399% FPG, which is consistent with eligibility for a Marketplace subsidy. The modal family income category for Medicaid is less than 138% FPG, with a slight shift to the 139%–199% FPG category when

TABLE 1 CHIME study sample characteristics by coverage type (Weighted)

Coverage type based on records	Coverage type based on health plan enrollment records			
	Total private + Public	Private, Non-group + Marketplace	Public, Medicaid	Public, Medicaid + MinnesotaCare ^a
	Total (CPS and ACS)	Total (CPS and ACS)	Total (CPS and ACS)	Total (CPS and ACS)
Total unweighted	3147	1487	1029	1660
Total weighted	458,264	46,624	351,381	411,640
Covered individual characteristics				
Age ^b				
Less than 18	43%	27%	52%	44%
18–25	11%	7%	11%	12%
26–44	26%	31%	22%	25%
45+	20%	34%	15%	19%
Health status ^c				
Excellent, very good, good, D/R	89%	97%	89%	89%
Fair, poor	11%	3%	11%	11%
Utilization (prior year through May 2015) ^{b,d}				
No claims	10%		9%	10%
Claims	90%		91%	90%
Respondent characteristics				
Gender ^c				
Female	69%	51%	83%	71%
Male	31%	49%	27%	29%
Race/ethnicity ^c				
White non-Hispanic	70%	95%	65%	67%
Asian, Black, Hispanic, Indigenous, Native Hawaiian and other Pacific Islanders, and multiracial (combined due to small sample size)	30%	5%	35%	33%
Education ^c				
High school or less, D/R	34%	20%	36%	27%
Some college or Associate degree	39%	28%	41%	44%
Bachelor degree or higher	27%	52%	23%	29%
Employment status (2014) ^c				
Employed part-time, part-year, or more	72%	83%	70%	71%
Not working, D/R	28%	17%	30%	29%
Employer size (2014) ^c				
99 or fewer	42%	67%	37%	39%
100 or more, D/R	58%	33%	63%	61%
Family characteristics				
Family income/FPG 2014 ^c				
<138%	49%	6%	57%	53%
139–199%	23%	10%	21%	24%
200–399%	21%	37%	19%	19%
400%+	7%	47%	3%	3%
Insurance coverage characteristics				
Shared coverage ^e				
Missing (respondent did not match enrollment record data)	17%	8%	21%	18%

TABLE 1 (Continued)

Coverage type based on records	Coverage type based on health plan enrollment records			
	Total private + Public	Private, Non-group + Marketplace	Public, Medicaid	Public, Medicaid + MinnesotaCare ^a
	Total (CPS and ACS)	Total (CPS and ACS)	Total (CPS and ACS)	Total (CPS and ACS)
Total unweighted	3147	1487	1029	1660
Total weighted	458,264	46,624	351,381	411,640
Proxy report in multi-person HH with same or different coverage ^f		41%		
Proxy report in multi-person HH with different coverage	10%		12%	11%
Proxy report in multi-person HH with same coverage	32%		32%	31%
Self-report in multi-person HH	21%	31%	17%	20%
Self-report in one person HH	20%	19%	18%	21%
Duration of coverage ^b				
Covered now and up to 6 mos prior	18%	14%	8%	9%
Covered now and 7–17 mos prior	45%	8%	31%	34%
Covered now and prior mos	37%	77%	61%	57%
Policyholder status of the respondent ^b				
Missing (respondent did not match enrollment record data)	18%	9%	22%	20%
No	45%	17%	51%	48%
Yes	37%	74%	27%	32%
Received a premium subsidy (relevant for Marketplace only) ^b				
Yes	1%	5%		
No	99%	95%		

Note: Results are weighted to account for differential survey response rates by age and coverage type and clustering within household. D/R combines “do not know” and “refused” responses. D/R prevalence was low (3.4% or less) and combined to maximize sample size; unweighted counts of missing data are as follows: Health status ($n = 47$), education ($n = 25$), employment status ($n = 98$), employment size ($n = 49$), and income ($n = 67$).

Abbreviations: ACS, American Community Survey treatment; CI, confidence interval; CPS, Current Population Survey treatment; FPG, federal poverty guidelines; HH, household; Mos—months; OR, odds ratio.

^aMinnesotaCare is a public program with a sliding scale premium comprised primarily of adults.

^bBased on administrative records data.

^cBased on survey data.

^dUtilization is measured using a Resource Utilization Band (RUB) based on the Johns Hopkins Adjusted Clinical Group (ACG) System. RUBs are not available for non-group and Marketplace (private) enrollees.

^eBased on combined survey and administrative records data.

^fCombination of the first two categories of “Shared coverage” as there were too few non-group and Marketplace cases with proxy report in multi-person household (HH) with different coverage.

Source: 2015 Comparing Health Insurance Measurement Error (CHIME) survey.

MinnesotaCare enrollees augment the public sample. We do not expect complete alignment between program enrollment and income from the survey: the survey asks about prior-year income for the family, whereas an applicant's previous year tax forms and two most recent pay stubs are used to determine income eligibility at the time of enrollment for Medicaid, MinnesotaCare, and Marketplace insurance.

Insurance coverage characteristics by type are also consistent with expectations. Public program eligibility is set at the person level, whereas private insurance offers both single and family plans. For

shared, 18%–21% of adult respondents with public coverage are not matched to administrative records because they are not enrolled in the same plan through the same insurance company as the covered individual, and thus are categorized as missing, as compared with only 8% for private insurance. We combined the two categories of proxy reporting (those providing proxy reports in multi-person households with the same and different coverage) because less than 1% of privately insured respondents reported for a person in their household enrolled in a different type of insurance. By contrast, we maintain both categories for public insurance: 12% of Medicaid and 11% of the

TABLE 2 Factors associated with accurate reporting of health insurance type, by coverage type and CHIME study survey treatment

Coverage type based on records	Coverage type based on health plan enrollment records						p-value	p-value	p-value	p-value
	Private, Non-Group + Marketplace	Public, Medicaid	Public, Medicaid + MinnesotaCare ^a	Private, Non-Group + Marketplace	Public, Medicaid	Public, Medicaid + MinnesotaCare ^a				
Survey treatment	CPS	ACS	CPS	ACS	CPS	ACS	CPS	ACS	CPS	ACS
Total unweighted	807	680	496	533	812	848	812	848	812	848
Total weighted	23,313	23,311	178,494	172,887	206,812	204,828	206,812	204,828	206,812	204,828
Reported correct type	77%	84%	83%	84%	81%	79%	81%	79%	81%	79%
Potential indicators of accurate reporting	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Insurance type indicator (reference = Non-group or Medicaid)										
Marketplace or MinnesotaCare	0.52 (0.24–1.13)		0.23 (0.08–0.64)	***	na		0.44 (0.23–0.86)	**	0.31 (0.16–0.60)	***
Covered individual characteristics										
Age (reference: aged 45 and older) ^b										
Less than 26										
Less than 18	1.34 (0.63–2.86)		1.02 (0.47–2.23)		na		1.22 (0.62–2.42)		1.12 (0.51–2.46)	
18–25	0.38 (0.19–0.76)	***	0.58 (0.18–1.89)		1.19 (0.37–3.84)		2.33 (0.62–8.71)		na	
26–44	0.76 (0.46–1.25)		0.91 (0.49–1.73)		0.76 (0.25–2.27)		0.73 (0.25–2.15)		na	
Health status (reference: report fair/poor health) ^c					1.15 (0.37–3.59)		0.83 (0.35–1.98)		1.38 (0.70–2.71)	
Excellent, very good, good, D/R	0.66 (0.28–1.53)		0.71 (0.27–1.90)		1.33 (0.46–3.85)		0.62 (0.26–1.49)		1.13 (0.48–2.66)	
Utilization (reference: any claims) ^{b,d}					0.62 (0.25–1.59)		1.08 (0.39–2.93)		0.78 (0.37–1.64)	
No claims	na		na		0.62 (0.25–1.59)		1.08 (0.39–2.93)		0.78 (0.37–1.64)	
Respondent characteristics										
Gender (reference: female) ^e										
Male	0.70 (0.39–1.25)		1.32 (0.64–2.75)		0.58 (0.23–1.43)		0.44 (0.19–1.06)		0.68 (0.34–1.38)	**
Race/ethnicity (reference: White non-Hispanic) ^e										
Asian, Black, Hispanic, Indigenous, Native Hawaiian and other Pacific Islanders, and multiracial (combined due to small sample size)	0.79 (0.19–3.22)		1.16 (0.36–3.69)		0.38 (0.16–0.88)	**	0.53 (0.21–1.30)	**	0.43 (0.21–0.86)	**
Education (reference: Bachelor degree or higher) ^f										
High school or less, D/R	1.37 (0.67–2.82)		0.64 (0.26–1.59)		0.66 (0.20–2.23)	***	0.28 (0.08–0.98)	***	0.68 (0.29–1.61)	
Some college, associate degree	1.15 (0.63–2.10)		2.08 (0.97–4.48)		1.83 (0.51–6.56)		0.54 (0.21–1.37)		1.86 (0.75–4.64)	
Employment status 2014 (reference: Not working, D/R) ^e										
Employed part-time, part-year or more	0.68 (0.27–1.67)		1.07 (0.34–3.40)		1.77 (0.59–5.35)		0.39 (0.14–1.11)		1.54 (0.63–3.79)	
Employer size 2014 (reference: 99 or fewer employees) ^e										
100 or more employees, D/R	0.65 (0.32–1.32)		1.11 (0.54–2.30)		0.70 (0.26–1.89)		0.65 (0.28–1.54)	**	0.87 (0.42–1.81)	**

TABLE 2 (Continued)

Coverage type based on records	Coverage type based on health plan enrollment records					
	Private, Non-Group + Marketplace			Public, Medicaid		
	CPS	ACS	ACS	CPS	ACS	ACS
Survey treatment	807	680	533	496	533	812
Total unweighted	23,313	23,311	172,887	178,494	172,887	206,812
Total weighted	77%	84%	84%	83%	84%	81%
Reported correct type						
Potential indicators of accurate reporting	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Public, Medicaid + MinnesotaCare ^a	CPS	ACS	ACS	CPS	ACS	ACS
Family characteristics						
Family income 2014 (reference: <138% federal poverty guideline) ^c						
139%-200%	1.87 (0.51-6.84)	0.51 (0.11-2.47)	0.82 (0.27-2.51)	0.82 (0.29-2.38)	0.85 (0.38-1.90)	0.91 (0.41-2.01)
200%-400%	1.00 (0.36-2.81)	2.50 (0.57-10.90)	0.65 (0.18-2.36)	0.13 (0.03-0.51)	0.57 (0.22-1.47)	0.28 (0.09-0.92)
>400%	1.45 (0.51-4.11)	2.45 (0.61-9.87)	0.19 (0.04-0.87)	0.09 (0.02-0.39)	0.20 (0.06-0.68)	0.16 (0.04-0.57)
Insurance coverage characteristics						
Shared coverage (reference: Self-report in one person HH) ^e						
Missing (respondent did not match plan data)	0.65 (0.28-1.52)	0.61 (0.18-2.08)	1.91 (0.51-7.19)	2.25 (0.50-10.22)	2.12 (0.67-6.72)	3.21 (0.91-11.30)
Proxy report in multi-person HH with same or different coverage ^f	0.74 (0.36-1.54)	0.46 (0.18-1.22)	na	na	na	na
Proxy report in multi-person HH with different coverage	na	na	3.98 (0.74-21.42)	0.80 (0.11-5.83)	3.35 (0.95-11.84)	1.11 (0.23-5.44)
Proxy report in multi-person HH with same coverage	na	na	1.65 (0.39-6.92)	0.86 (0.25-2.94)	1.49 (0.60-3.69)	1.21 (0.50-2.93)
Self-report in multi-person HH	0.77 (0.43-1.38)	0.49 (0.22-1.10)	2.47 (0.76-8.07)	0.77 (0.31-1.94)	1.94 (0.90-4.17)	0.61 (0.28-1.32)
Duration of coverage (reference: Covered now and prior 18 months) ^b						
Covered now and up to 6 mos prior	0.40 (0.19-0.84)	1.58 (0.72-3.47)	0.58 (0.20-1.71)	0.58 (0.17-1.94)	0.85 (0.37-1.96)	0.69 (0.26-1.84)
Covered now and 7-17 mos prior	0.49 (0.23-1.05)	1.08 (0.33-3.58)	1.05 (0.37-2.95)	0.74 (0.35-1.57)	1.01 (0.48-2.13)	0.75 (0.40-1.39)
Policyholder status (reference: respondent is policyholder) ^b						
Not policyholder	1.29 (0.56-2.98)	3.20 (0.84-12.18)	0.59 (0.21-1.71)	1.67 (0.57-4.91)	0.79 (0.37-1.67)	2.04 (0.88-4.74)
Premium subsidy (reference: No subsidy) ^b						
Receives subsidy	1.30 (0.52-3.22)	4.88 (1.33-17.90)	na	na	na	na

Note: Results are weighted to account for differential survey response rates by age and coverage type and clustering within household. D/R combines “do not know” and “refused” responses. D/R prevalence was low (3.4% or less) and combined to maximize sample size; unweighted counts of missing data are as follows: Health status (n = 47), education (n = 25), employment status (n = 98), employment size (n = 49), and income (n = 67). Abbreviations: ACS, American Community Survey treatment; CI, confidence interval; CPS, Current Population Survey treatment; FPG, federal poverty guidelines; HH, household; Mos, months; na, not applicable; OR, odds ratio.

^aMinnesotaCare is a public program with a sliding scale premium comprised primarily of adults.

^bBased on administrative records data.

^cBased on survey data.

^dUtilization is measured using a Resource Utilization Band (RUB) based on the Johns Hopkins Adjusted Clinical Group (ACG) System. RUBs are not available for non-group and Marketplace (private) enrollees.

^eBased on combined survey and administrative records data.

^fCombination of the first two categories of “Shared coverage” as there were too few non-group and Marketplace cases with proxy report in multi-person household (HH) with different coverage.

p < 0.05; *p < 0.01.

Source: 2015 Comparing Health Insurance Measurement Error (CHIME) survey.

augmented-sample respondents reported coverage for a person in their household with different coverage.

Consistent with differences in plan structure and eligibility described above, 74% of respondents with private insurance are the policyholder according to administrative records, compared with 27% of respondents with Medicaid coverage. The concept of “policyholder” is less meaningful with public coverage because enrolled children in Medicaid are the policyholder, although they are likely enrolled by their parents. Finally, administrative records indicate 5% of the combined non-group and Marketplace insured received a premium subsidy; however, subsidies are only applicable for those with Marketplace coverage, for whom 69% received a subsidy (data not shown).

Table 2 provides odds ratios and 95% confidence intervals for each potential correlate of accurately reporting private direct purchase and public coverage among people with known coverage based on enrollment records separate for those assigned the CPS and ACS treatments. The insurance type indicator is significant (Table 2, row 1) for the private insurance strata (ACS only) and the augmented public insurance strata (ACS and CPS treatment), suggesting the two insurance types should not be combined. Again, the ACS survey is not designed to distinguish between different forms of private direct purchase or public insurance, so we cannot address this for the ACS treatment. We find that among private insurance enrollees, Marketplace enrollees are less accurate reporters of coverage type than non-group enrollees in the ACS treatment. Among public insurance enrollees in either the CPS or ACS treatment, MinnesotaCare enrollees are less accurate reporters of coverage type than Medicaid enrollees.

Overall accuracy in reporting insurance type is 77% for non-group/direct purchase coverage among CHIME respondents receiving the CPS treatment and 84% of those receiving the ACS treatment. For the ACS treatment, accurate reporting of public insurance in the Medicaid-only and augmented public sample is 84% and 79%, respectively; in the CPS treatment, it is 83% and 81%, respectively. Because MinnesotaCare is a smaller program than Medicaid, lower reporting accuracy for MinnesotaCare enrollees (69% and 53% for CPS and ACS treatments, respectively) only modestly deflates accuracy in the augmented sample.

Eight covariate odds ratios reach significance ($p < 0.05$ or better) for the ACS treatment and six for the CPS treatment. Beginning with private insurance, the odds of accurately reporting non-group insurance are lower for young adults (aged 18–25), compared with older adults (aged 45 and older) under the CPS treatment. Under this treatment, the odds of accurately reporting non-group insurance were also lower for those currently enrolled but for a shorter period (6 months or less) compared with those enrolled over a longer period (up to 18 months). For the ACS treatment, the odds of accurately reporting direct purchase insurance are higher for those receiving a subsidy. Among Marketplace enrollees—those for whom the subsidy actually applies—86% with a subsidy accurately report private insurance compared with 61% without ($p < 0.01$; data not shown).

For the CPS treatment, the odds of reporting Medicaid coverage accurately is lower among Asian, Black, Hispanic, Indigenous, Native

Hawaiian and other Pacific Islanders, and multiracial (combined due to small sample sizes) respondents, as well as among those with family incomes 400% FPG or more. Under the ACS treatment, the odds of accurate reporting of Medicaid coverage are lower for those with the least education—those with a high school diploma or less—compared with those with 4 years or more of college. The odds of accurately reporting Medicaid coverage under the ACS treatment are also lower for those with incomes exceeding 200% FPG, compared with those with incomes equal to or less than 138% FPG.

Because Medicaid is the larger of the two public programs, the augmented results (combined Medicaid and MinnesotaCare) mirror the Medicaid-only results. However, for the ACS, the odds of accurately reporting augmented public coverage is lower for males than for females, and lower for persons working for a large employer (100 employees or more) compared with a smaller employer.

Because the CPS allows the distinction between different forms of public insurance, we report results for MinnesotaCare separately from Medicaid. In the CPS sample, accuracy is higher for those enrolled in Medicaid than MinnesotaCare (83% vs. 69%, respectively). For those enrolled in MinnesotaCare only (Table 3), the odds of accurately reporting public insurance is higher for younger (aged 18–25 and 26–44) than older enrollees (45 and older) and respondents with some college or an associate degree (compared with a bachelor's degree or higher). Consistent with Medicaid and augmented results, the odds of accurate reporting are higher for enrollees in low-income families (equal to or less than 138% FPG compared with 200%–400% FPG), whereas the relationship between employer size and accurate reporting was not significant for the CPS treatment (Table 2). By contrast, respondents with MinnesotaCare working for an employer with 100 or more employees are more accurate reporters of public insurance.

4 | DISCUSSION AND CONCLUSIONS

Reporting accuracy is quite high for public and private coverage and across survey treatments (77%–84%). Past studies of factors associated with accurate reporting of insurance coverage type have focused only on Medicaid. Our results are consistent with prior research showing greater Medicaid reporting accuracy among people with more modest education and who live in lower-income families.^{3,4,8,11,12} That is, people living in circumstances consistent with eligibility for public insurance are more accurately reported to have that coverage. Contrary to past research focused on Medicaid enrollees,^{4,11,12} in this study, neither self-reported health status nor administrative records of health care use were significant correlates of public coverage for either insurance treatment.

Reverse record check studies are less common for private insurance, and this is the first to examine correlates of reporting accuracy with multivariate analysis.^{5,6} This study found only a few factors are significantly associated with reporting accuracy, and these vary by survey treatment. The odds of accurately reporting non-group coverage were lower for younger adults (aged 18–25) compared with those

TABLE 3 Factors associated with accurate reporting of public health insurance type in the CHIME study (CPS treatment)

Coverage type based on records	Coverage type based on health plan enrollment records					
	Public, Medicaid			Public, MinnesotaCare ^a		
	CPS			CPS		
Survey treatment						
Total unweighted		496			331	
Total weighted		178,494			30,496	
Reported correct type		83%			69%	
Potential indicators of accurate reporting	OR	(95% CI)	p-value	OR	(95% CI)	p-value
Covered individual characteristics						
Age (reference: aged 45 and older) ^b						
Less than 26	na			2.97	(1.23–7.16)	**
Less than 18	1.19	(0.37–3.84)		na		
18–25	0.76	(0.25–2.27)		na		
26–44	1.15	(0.37–3.59)		2.11	(1.04–4.28)	**
Health status (reference: report fair/poor health) ^c						
Excellent, very good, good, D/R	1.33	(0.46–3.85)		1.00	(0.42–2.36)	
Utilization (reference: any claims) ^{b,d}						
No claims	0.62	(0.25–1.59)		1.80	(0.85–3.80)	
Respondent characteristics						
Gender (reference: female) ^c						
Male	0.58	(0.23–1.43)		1.28	(0.65–2.54)	
Race/ethnicity (reference: White non-Hispanic) ^c						
Asian, Black, Hispanic, Indigenous, Native Hawaiian and other Pacific Islanders, and multiracial (combined due to small sample size)	0.38	(0.16–0.88)	**	0.77	(0.34–1.71)	
Education (reference: Bachelor degree or higher) ^c						
High school or less, D/R	0.66	(0.20–2.23)		1.40	(0.62–3.13)	
Some college, Associate degree	1.83	(0.51–6.56)		2.61	(1.12–6.08)	**
Employment status 2014 (reference: Not working, D/R) ^c						
Employed part-time, part-year or more	1.77	(0.59–5.35)		1.05	(0.37–3.01)	
Employer size 2014 (reference: 99 or fewer employees) ^c						
100 or more employees, D/R	0.70	(0.26–1.89)		2.37	(1.01–5.53)	**
Family characteristics						
Family income 2014 (reference: ≤138% federal poverty guideline) ^c						
139%–200%	0.82	(0.27–2.51)		0.63	(0.27–1.50)	
200%–400%	0.65	(0.18–2.36)		0.28	(0.10–0.77)	***
>400%	0.19	(0.04–0.87)	**	0.30	(0.07–1.18)	
Insurance coverage characteristics						
Shared coverage (reference: Self-report in one person HH) ^e						
Missing (respondent did not match plan data)	1.91	(0.51–7.19)		1.28	(0.21–7.75)	
Proxy report in multi-person HH with same or different coverage ^f						
Proxy report in multi-person HH with different coverage	3.98	(0.74–21.42)		0.62	(0.11–3.58)	
Proxy report in multi-person HH with same coverage	1.65	(0.39–6.92)		0.46	(0.18–1.21)	
Self-report in multi-person HH	2.47	(0.76–8.07)		0.88	(0.43–1.82)	
Duration of coverage (reference: Covered now and prior 18 months) ^b						
Covered now and up to 6 mos prior	0.58	(0.20–1.71)		0.94	(0.39–2.24)	
Covered now and 7–17 mos prior	1.05	(0.37–2.95)		0.55	(0.25–1.22)	

(Continues)

TABLE 3 (Continued)

Coverage type based on records	Coverage type based on health plan enrollment records					
	Public, Medicaid			Public, MinnesotaCare ^a		
	CPS			CPS		
Survey treatment						
Total unweighted		496			331	
Total weighted		178,494			30,496	
Reported correct type		83%			69%	
Potential indicators of accurate reporting	OR	(95% CI)	p-value	OR	(95% CI)	p-value
Policyholder status (reference: respondent is policyholder) ^b						
Not policyholder	0.59	(0.21–1.71)		1.36	(0.45–4.12)	
Premium subsidy (reference: receives subsidy) ^b						
No subsidy	na			na		

Note: Results are weighted to account for differential survey response rates by age and coverage type and clustering within household. D/R combines “do not know” and “refused” responses. D/R prevalence was low (3.4% or less) and combined to maximize sample size; unweighted counts of missing data are as follows: Health status ($n = 47$), education ($n = 25$), employment status ($n = 98$), employment size ($n = 49$), and income ($n = 67$).

Abbreviations: CI, confidence interval; CPS, Current Population Survey treatment; FPG, federal poverty guidelines; HH, household; Mos, months; na, not applicable; OR, odds ratio.

^aMinnesotaCare is a public program with a sliding scale premium comprised primarily of adults.

^bBased on administrative records data.

^cBased on survey data.

^dUtilization is measured using a Resource Utilization Band (RUB) based on the Johns Hopkins Adjusted Clinical Group (ACG) System. RUBs are not available for non-group and Marketplace (private) enrollees.

^eBased on combined survey and administrative records data.

^fCombination of the first two categories of “Shared coverage” as there were too few non-group and Marketplace cases with proxy report in multi-person household (HH) with different coverage.

** $p < 0.05$; *** $p < 0.01$.

Source: 2015 Comparing Health Insurance Measurement Error (CHIME) survey.

aged 45 and older with the CPS treatment. This is consistent with the notion that older adults have more need for health care services,¹⁹ and therefore engage more with their insurance.

Several coverage characteristics from enrollment records are significantly associated with the accuracy of non-group reporting. Those covered a shorter time (CPS treatment) had lower odds of reporting private coverage (Table 2), specifically for non-group versus Marketplace (data not shown). Prior studies show that when the CPS asked about coverage in the prior calendar year (before the redesign), both recency and duration of enrollment were consistently tied to accurate reporting of public coverage.^{3,4} In the redesign (which first asks about coverage at the time of the survey and then includes questions that look back to the calendar year), duration is no longer significantly associated with accuracy in reporting for public insurance.

For the ACS treatment, direct purchase insurance reporting is more accurate for enrollees who, according to administrative records, receive a premium subsidy. Although we cannot separate non-group and Marketplace here, subsidies are only available for Marketplace coverage. This finding suggests that having a subsidy helps respondents accurately report direct purchase coverage in the ACS. In 2019 (after the CHIME survey was fielded), the ACS added two auxiliary questions (premium and subsidy) to estimate subsidized Marketplace coverage.²⁰ Separate CHIME studies show subsidy reporting is reasonably accurate among those enrolled in a

subsidized Marketplace plan (90.3% in the CPS treatment; 72.4% in the ACS treatment).^{14,21}

Accurately reporting public coverage is diminished when MinnesotaCare enrollees are combined with Medicaid enrollees. This finding is of interest because the majority of states have public programs that charge a premium to some enrollees like those in MinnesotaCare.¹⁵ The specific impact in each state will depend on the size of premium charging programs relative to non-premium charging public programs. Further, correlates of reporting accuracy will vary by the array of public program offerings in the state and the programs' eligibility goals and criteria (e.g., CHIP targets children, whereas Medicaid expansion often targets adults). MinnesotaCare is available to low-income adults whose employer does not offer insurance (e.g., small employers) or offers insurance that does not meet the definition of “Minimum Essential Coverage” (the same qualification that allows people to get tax credits on the Marketplace). Consistent with eligibility rules, accurate reporting of public insurance is higher for younger adults and those living in low-income households. Public coverage reporting for people enrolled in MinnesotaCare is also more accurate for respondents working for larger employers (100 or more employees). We speculate that the CPS design, which first sorts respondents into job and government sources of coverage, may foster more accurate public reporting for MinnesotaCare enrollees. Further, because the ACA requires large employers to offer insurance,

employees in larger firms may be more aware of their lack of an affordable offer and the need to apply for public insurance.

This study has several limitations that may bound generalizability. First, CHIME was fielded in a state that is, on average, more non-Hispanic White, educated, and affluent (characteristics our weights cannot account for)^{22,23} and created its own Marketplace rather than relying on the federal Marketplace (HealthCare.Gov). However, because race and ethnicity are not consistently associated with reporting accuracy and private and public insurance offerings examined here are available across all states, our findings may hold outside of Minnesota. Second, the insurance plan providing the validation data represents one of several insurers in the state. Further, this plan had higher Marketplace premiums than competing plans in the year of the survey. It is not known whether Marketplace enrollees in our sample were more affluent than those selecting other plans. Either way, our results indicate family income was not significantly associated with reporting accuracy among those with private insurance generally or Marketplace coverage specifically. Third, the sample size of the Marketplace strata was too small to analyze separately in the CPS treatment, although we suspect correlates of reporting accuracy are different for non-group and Marketplace enrollees. Fourth, the CHIME study included only telephone surveys, whereas the CPS is primarily administered through in-person interviews, and the ACS includes self-administered survey modes (e.g., web and paper). Past research indicates item non-response in the ACS is lower in telephone than self-administered mode, but measurement bias was not explored.²⁴ Fifth, unlike the CPS and ACS, the CHIME survey was only available in English, which may introduce bias, however small due to high rates of English language proficiency in Minnesota.²⁵ Sixth, the CHIME study took place following the second open enrollment period when Marketplaces continued to receive media attention. It is impossible to say whether this impacts measurement error, or how this may change over time. Finally, past validation studies also examine correlates of false-negative among Medicaid enrollees—those reported as uninsured when records say otherwise^{3,8,11}—this study cannot because all participants were insured at the time of the survey. False reports of uninsurance in the CHIME study were under 4% and sample sizes were too low to support this analysis.⁷

Despite these limitations, this study makes significant contributions. It is the first study to explore factors associated with accurate insurance type reporting after the passage of the ACA and creation of the Marketplace. It is also the first to examine correlates of accurate reporting for private non-group insurance, and the first examination following the 2014 redesign of the CPS health insurance questions.

An overarching message resulting from this study is that reporting accuracy is quite high, and few factors significantly predict reporting accuracy, particularly for private non-group coverage. From a measurement perspective, this is interpreted as a good thing, especially considering the complexity of health insurance measurement and a constantly changing policy environment. That said, several results have important implications for editing and imputation of survey data. First, people known to receive a premium subsidy more accurately reported direct purchase insurance than those not receiving a subsidy in the ACS treatment. This result bodes well for the addition of premium and subsidy questions in the ACS.²⁰ Further

analysis of the portal, premium, and subsidy questions among CHIME participants assigned to the ACS treatment is needed. In the CPS treatment, plan name, portal, and premium responses were important to correct categorization of Marketplace insurance.¹⁴ Second, across both survey treatments, people whose opportunity structures (race, ethnicity, income) match public program eligibility are accurate reporters of this coverage. This evidence supports using these commonly collected demographic variables in simulation, imputation, and editing routines.

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REFERENCES

1. Call KT, Davern ME, Klerman JA, Lynch V. Comparing errors in Medicaid reporting across surveys: evidence to date. *Health Serv Res.* 2012;48(2 Part 1):652-664. <https://doi.org/10.1111/j.1475-6773.2012.01446.x>
2. Davern M, Klerman JA, Baugh DK, Call KT, Greenberg GD. An examination of the Medicaid undercount in the Current Population Survey: preliminary evidence from record linkage. *Health Serv Res.* 2009;44(3):965-987.
3. Noon JM, Fernandez LE, Porter SR. Response error and the Medicaid undercount in the Current Population Survey. *Health Serv Res.* 2019 Feb;54(1):34-43. <https://doi.org/10.1111/1475-6773.13058>
4. Pascale J, Roemer MI, Resnick DM. Medicaid underreporting in the CPS. *Public Opin Q.* 2009;73(3):497-520. <https://doi.org/10.1093/poq/nfp028>
5. Davern M, Call KT, Ziegenfuss J, Davidson G, Beebe TJ, Blewett L. Validating health insurance coverage survey estimates: a comparison of self-reported coverage and administrative data records. *Public Opin Q.* 2008;72(2):241-259. <https://doi.org/10.1093/poq/nfn013>
6. Nelson DE, Thompson BL, Davenport NJ, Penaloza LJ. What people really know about their health insurance: a comparison of information obtained from individuals and their insurers. *Am J Public Health.* 2000; 90(6):924-928. <https://doi.org/10.2105/AJPH.90.6.924>
7. Pascale J, Fertig AR, Call KT. Validation of two federal health insurance survey modules after Affordable Care Act implementation. *J Off Statist.* 2019;35:409-460. <https://doi.org/10.2478/JOS-2019-0019>
8. Boudreaux MH, Call KT, Turner J, Fried B, O'Hara B. Measurement error in public health insurance reporting in the American Community Survey: evidence from record linkage. *Health Serv Res.* 2015;50(6): 1973-1995. <https://doi.org/10.1111/1475-6773.12308>

9. Urban Institute. The Transfer Income Model TRIMSM. 1997. Accessed December 14, 2020. <https://www.urban.org/research/data-methods/data-analysis/quantitative-data-analysis/microsimulation/transfer-income-model-trim>
10. Pascale J. Modernizing a major federal government survey: a review of the redesign of the Current Population Survey health insurance questions. *J Off Statist*. 2016;32(2):461-486. <https://doi.org/10.1515/JOS-2016-0024>
11. Call KT, Davidson G, Davern ME, Brown ER, Kincheloe J, Nelson JG. Accuracy of self-reported health insurance coverage among Medicaid enrollees. *Inquiry*. 2008;45(4):438-456.
12. State Health Access and Data Assistance Center/University of Minnesota (SHADAC), the Office of the Assistant Secretary for Planning and Evaluation (ASPE), the U.S. Census Bureau (Census), the Centers for Medicare and Medicaid Services (CMS)-SNACC. SNACC Phase II Research Results: Examining discrepancies between the National Medicaid Statistical Information System (MSIS) and the Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC). 2007. Accessed November 14, 2020. <https://www.shadac.org/publications/snacc-phase-ii-report>
13. Boudreaux M, Noon JM, Fried B, Pascale J. Medicaid expansion and the Medicaid undercount in the American Community Survey. *Health Serv Res*. 2019;54:1263-1272. <https://doi.org/10.1111/1475-6773.13213>
14. Pascale J, Fertig AR, Call KT. Assessing the accuracy of survey reports of health insurance coverage using enrollment data. *Health Serv Res*. 2019;54:1099-1109. <https://doi.org/10.1111/1475-6773.13191>
15. Fertig AR, Pascale J, Call KT, Oellerich D. Design and Sampling Strategy for a Validation Study Linking Enrollment Records to Survey Reports: The CHIME Study. 2019. Accessed December 16, 2020. https://www.shadac.org/sites/default/files/publications/CHIME_study_design_update_June2019.pdf
16. American Association of Public Opinion Research (AAPOR). Standard definitions: Final dispositions of case codes and outcome rates for surveys (9th edition). 2016. Accessed December 16, 2020. https://www.aapor.org/AAPOR_Main/media/publications/Standard-Definitions20169theditionfinal.pdf
17. Bailey ZD, Krieger N, Agénor M, Graves J, Linos N, Bassett MT. Structural racism and health inequities in the USA: evidence and interventions. *Lancet*. 2017;389:1453-1463.
18. Gee GC, Ford CL. Structural racism and health inequities. *Du Bois Review*. 2011;8:115-132.
19. Agency for Healthcare Research and Quality (AHRQ). Medical Expenditure Panel Survey: Total Number of Events in Millions by Age Groups, United States, 1996–2018. https://meps.ahrq.gov/meps_trends/hc_use/. Generated interactively February 3, 2021.
20. Hernandez-Viver A, Berchick ER. Subsidized Marketplace Coverage in the American Community Survey (SEHSD Working Paper 2020-14). September 17, 2020. Accessed December 16, 2020. <https://www.census.gov/content/dam/Census/library/working-papers/2020/demo/sehswp2020-14.pdf>
21. Pascale J, Fertig AR, Call KT. Measuring Health Insurance in the American Community Survey: Assessing the New Premium and Subsidy Items. Presented at the American Association of Public Opinion Research, Virtual, May 12, 2021.
22. U.S. Census Bureau. Table DP05 ACS Demographic and Housing Estimates. 2016. Accessed June 28, 2018. <https://data.census.gov/cedsci/table?q=Table%20DP05%20ACS%20Demographic%20and%20Housing%20Estimates.%202016&tid=ACSDP1Y2016.DP05>
23. U.S. Census Bureau. Table S1201 Educational Attainment. 2016. Accessed June 28, 2018. <https://data.census.gov/cedsci/table?q=Table%20S1201%20Educational%20Attainment.%202016&tid=ACST1Y2016.S1501>
24. Turner J, Boudreaux M, Lynch V. A Preliminary Evaluation of Health Insurance Coverage in the 2008 American Community Survey: Final Report. US Census Bureau. 2009. Accessed April 16, 2021. https://www.census.gov/library/working-papers/2009/acs/2009_Turner_01.html
25. SHADAC Analysis of the 2016 American Community Survey (ACS) Public Use Microdata Sample (PUMS) File. July 26, 2021.

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